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SHOUT
SHARE
IT

Chlorospingus opthalmicus.

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Juvenile Begging silent ♂

Chlorospingus ophthalmicus

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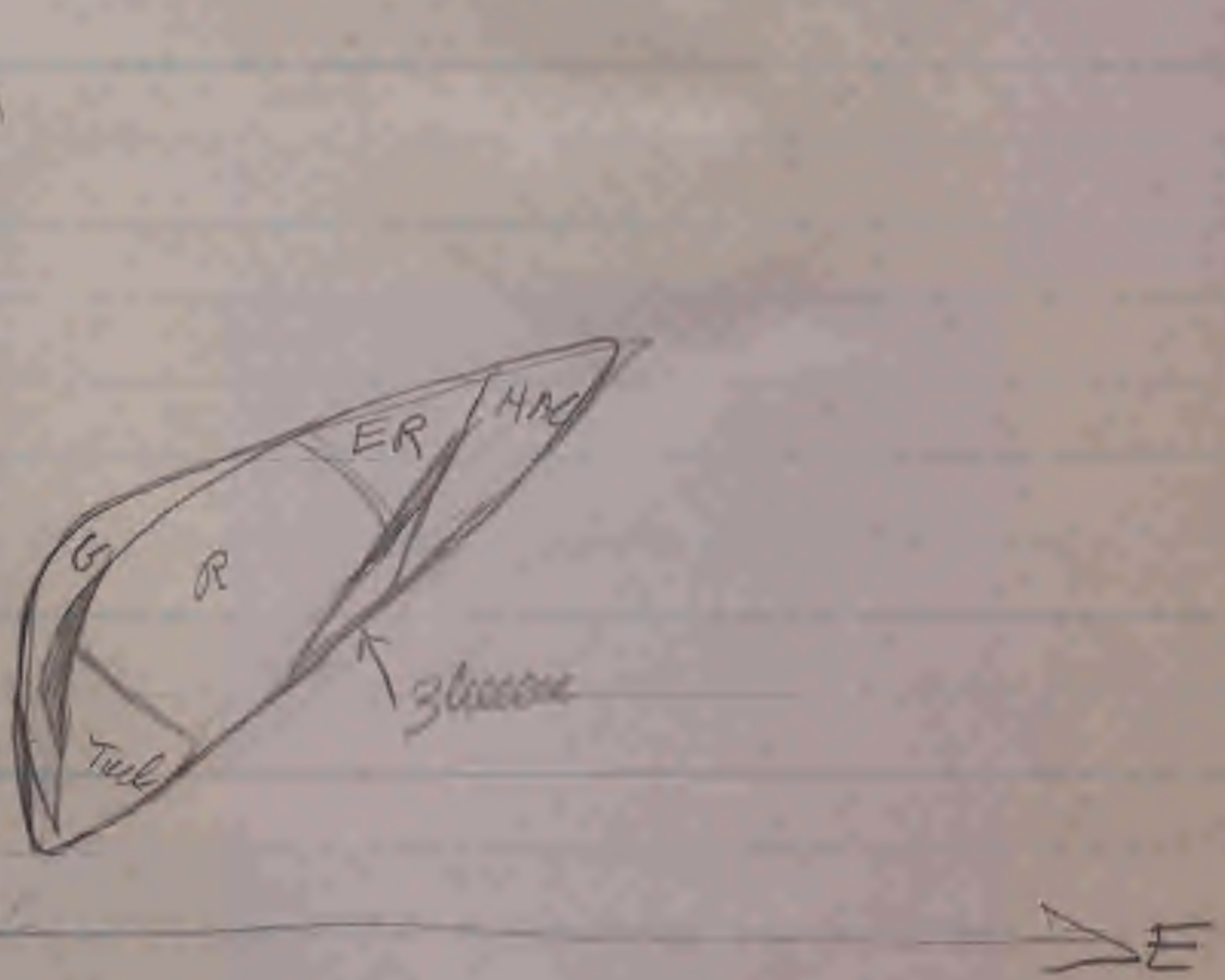

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Sept 10, 1958
Cano Punta

Brown-Capped

***** = ophthalmicus = Common Bush-Tanager

Quite a lot of these birds here, moving about & feeding in small flocks in second-growth trees.

General effect is quite warbler-like. Fat & small-headed. Very restless.

Lots of TF & WF 'ings. WF's are very extreme. So are the TF's. TF's with very strong lateral component, usually U-D, 9 tenuis.

Constantly uttering single CN's. Quite variable. Usually more or less "Jit"-like.

Occasionally uttering a song of some sort. Apparently usually by isolated birds. Began by a few "Jit"-like notes - perhaps relatively low in pitch - and ending into a Trill. Perhaps more or less comme ça: "Duh duh duh tsreeeeee"

A single juvenal bird "begged" from an adult with silent Qu. Twice. No response either time

These little flocks of Bush-tanagers are quite frequently associated with other species in rather loose mixed flocks. Particularly Myioborus miniatus and Wilsonia pusilla. Also Myioborus torquatus, Vireo leucophrys all sort of yellow-rumps. Possibly also Basileuterus tibialis. May be more than coincidence.

I have seen a little more of the variation in CN's and related patterns. The ordinary "real" CN of an unexcited or un-

alarmed bird is a very weak "Tsit". Single, possibly repeated at definitely moderately long intervals. At higher intensities (of something), when a bird is excited (or alarmed by my presence ??) this may be replaced by doublets or triplets of much louder more penetrating notes "Tseet tseet" or "Tseeet tseeet tseeet".

Chlorospingus, I

September 19, 1958
Cerro Punta

Some of the apparently quite un-alarmed single CN's have a "Aah" undertone, which is just slightly reminiscent of the Rhampholemus tanagers.

The birds were very vocal this morning — when I was putting the nets up and couldn't watch them. Lots of "song", more or less as described on the preceding page. Sometimes very long & loud "Jorosaca" notes without preliminaries. Usually the few introductory notes as described above.

This species does not have much in the way of an invitational rigid semi-stretch posture before flying up in ordinary circumstances just the slightest diagonal upward pointing of the bill. Comme ça, more or less.

With WF & TF.

probably very extreme

The pure "Tsit" CN's may emit a stronger alarm component than the CN's with "Aah" undertone. More often given by birds conscious of my presence

One form of "song", probably not near highest intensity, is more or less comma-like "Juh tuh tatatreeeeeah"

Does this sound like some of the peculiar vocalizations of the Yellow-rumped Tanagers? I think so

I just caught a Bush-tanager in the net, and took it out and put it in a cage. Quite silent throughout. It did, however, do repeated C's when I held it in hand. Opening & closing bill in a regular rhythm. Hurriedly (or (more probably) slightly) intensified int mor of listing.

I have just been watching a mixed flock of Bush-tanagers, Flaty-throated Redstarts, Yellow-thighed Finches, and Yellow-throated Atlapetes, feeding in some bushes. The Bush-tanagers seem to play the same role in these flocks as the Plain-colored Tanagers do in the mixed flocks of tanagers and honeycreepers on BCI.

It may be significant, therefore, that familiarity hearing of their calls & notes has impressed me with their resemblance to the calls & notes of the Plains. In this flock, the "Treeeeee" notes seemed to be merely an acceleration of the ordinary "Tsit" CN's — quite comparable to the CN-fill's of the Plains!! Apparently this CN-fill (as I shall call it from now on) is given in flight. Certainly sometimes given before flying up.

The bill is opened & closed with each CN. I think it is kept open & vibrated through each CN-fill.

The CN-fill must be a relatively high intensity pattern

It was quite common early this morning, but now (7.45) it seems to have died out completely. The birds are still uttering lots of CN's, however, and it is CN's, not CN full's, that they give when they fly away

I have caught 2 more Buff-throated Saltators in the net. One got away; I put the other in the cage. Both quite silent

The two captive birds are becoming a little vocal now. Uttering "grit" type CN's — occasionally in series. Often as a response to CN's by neighbouring wild birds. Sometimes inducing CN's as a response by the wild birds

Occasionally disputing with the finches in the same cage. Sometimes just doing silent G to an opponent. The bill may be kept extremely wide open for quite a long time during a G.

They have also been uttering another sound rather like the CN full may have confused with (17th). They call, which (and which I may) as "free" or the CN full on Sept "freee sreee" or even could be transcribed sreee sreee." Without the "free sreee sreeee of the real CN full. The way in sreeeee" or "free which single notes, doublets, triplets or even quadruplets mmm rattle effect can be uttered is particularly reminiscent of the CN's of the Euphonias, particularly the Rufous-vented, but I think that this resemblance is quite deceptive

I am not sure if this "freeee" call is always ac-

companied by ritualized movements or not. (Once I saw a bird give a 3-note "Freeee" call from an apparently ordinary sitting posture, opening & closing its bill with each note.) It is definite, however, that sometimes the "Freeee" call is accompanied by G, the bill held wide open through out the whole call, even if the call includes 3 or 4 notes.

The postures accompanying both silent G's and G's & "Freeee" call (which I shall term "frg") are quite variable in other respects. I.E. only the bill position is ritualized.

But there is a definite tendency for both types of G to be accompanied by little, obviously aggressive, jabbing or pecking mvt. mvts. (The posture shown above on p. 4 is one of the more common aggressive postures accompanying G's during disputes on the ground.)

It is obvious, I think, that the frg is relatively very aggressive, and the notes are probably strictly homologous with the HAC Notes of other species

September 20, 1958
Cerro Punta

E.E watched a single bird singing. Just before lifted up its head while it sang. E.E transcribes song as "Tsuck" (or "Tuck") "Tsutsitsweeyoo" Second part of phrase louder & more drawn out. Repeated several times after pauses of variable lengths.

Chilonguenga, I — September 21, 1958
Cerro Punta

Yesterday, I noticed that the captive birds still did did the buzz Irg Notes during disputes in the cage. Sometimes utterred ii long series of at least 10 or 12 notes — quite continuous, no regii of division into doublets or triplets or anything like that.

Unfortunately, one of the captive birds was dead this morning, and I am sadly sure that another will be soon.

Watching a flock of Buff-tanagers this morning, morning & feeding as part of a mixed flock. A little dispute broke out among them, and there was a lot of chasing back & forth ii obvious aggressive attack movements. (None of the birds came into actual contact with one another, however.) All this aggressiveness was accompanied by lots and lots of Irg Notes in very very long series, either continuous, or broken up into irregular groups of anything from 6 to 20. Also a few CN's, and a lot of CN Till's.

This species seems to give its Irg relatively much more frequently than (most) other species give HRC Notes.

This outburst of aggressiveness was followed by a burst of singing in the group, probably involving the actual birds who were fighting and some others as well. This would certainly suggest that the "song" contains a hostile component. (It is usually very difficult to determine exactly what are the social circumstances of the song of this species — the group as a whole is too active and cloudy-knit. It certainly doesn't seem to

Chlorospingus, Sep 21, 1958, II

(It used as a regular form of "greeting" Or by an isolated bird trying to call in others.)

The actual sound of the rough this morning has been very much like E.E's transcription yesterday on p. 5. Sometimes with a little extra note or two at the end. Perhaps "Uuh uh" — — Probably just "running down", or perhaps a couple of CN's. Sometimes seems like a little extra "flourish" ~

This rough is given from an absolutely ordinary posture. The bird doesn't even bother to sit up to do it

These Bush-tanagers may be the nuclear species in the mixed flocks, but they are by no means always the leaders Various warblers may lead the way But the tanagers are so much the noisiest & most conspicuous members of the arboreal members of the flocks (the Yellow-thighed Finches are just as conspicuous, but less numerous and usually not as near the center of the flock) that I don't think the rest of the flock follows the leading warblers unless the tanagers do.

Chlorospingus, I March 1, 1959
Cerro Punta

Still lots of these Bush-tanagers around. This morning, at least, their social relations were rather different from last September. This morning, they did not seem to be part of mixed flocks (although there are still plenty of warblers and Yellow-thighed Finches around). Some of the Bush-tanagers seemed to be associated in flocks of their own species alone, while I also saw several spp.

recently single birds (unmated ♂'s ?) which seemed to stay in one particular area, singing repeatedly from different trees in this area.

(Yesterday, however, we saw some Buff-throated Saltators in the same trees as some Silver-throated Tanagers and various warblers - this might have been a mixed flock; but it might also have been "coincidence" - just a group of birds assembled together to feed on the same food.)

The songs I have heard today were quite variable, but resembled those I heard last September. Usually one or two CN-like notes, followed by a "CN trill", usually followed by one or two more CN-like notes. Most of the CN-like notes in these circumstances could be transcribed by something like "Whit", but some were definitely longer & higher-pitched "Whreeet". I heard these songs given by both single birds, at quite some distance from any other tanagers; by apparently single territorial birds quite close to one another; and, apparently, by birds moving about or associating with flocks. In any case, these birds are no "settlers", moving about & flying from tree to tree so frequently, that the song was frequently uttered before and/or during flight. This was particularly true when several birds were close together. It is certainly my impression that the CN-trill part of the song is much longer during (& possibly before) flight than when a bird is singing relatively placidly.

Once when several birds were singing more or less close together, an aerial chase developed. I couldn't see how this started, but it was quite long-sustained, the birds twisting back & forth accompanied by single "Whit" or "Trit" CN's, but no other sounds.

Yesterday, when we first arrived, we saw a furious fight between two birds. One was certainly a Buff-throat, and the second probably was one. This fight was accompanied by furious HAC quite like that of other species.

Chlorospingus, I — March 4, 1959
Cerro Punta

Some very interesting behavior this morning, which has cleared up some of the problems which have been worrying me for some time. Also raises some new problems.

Began by a long performance between 2 birds. More or less commune en. One bird flew from perch to perch within a fairly limited area usually giving song as it flew to a perch, or while sitting on the perch. The second bird "followed" the first, going from perch to perch in a similar way, but never landing right beside the first. Usually picking out a perch anything from 1 ft to 10 ft away from the first bird. Also giving song as it flew to a perch and/or after landing on the perch. This behavior looked almost like a form of inhibited supplanting attacks, except that the first bird (let us call it A) and not the second (B) seemed to be controlling the whole performance.

The songs during this part of the performance were quite characteristic. Containing very long "bzzzzzzzz" musical components. A typical song at this time might possibly be transcribed by something like "Suck Suck Spit tsit tsit zzzzzzzz

these songs — and all other songs in other circumstances for that matter — is extremely variable all the introductory notes seem to be something more than ordinary CN's They are extremely variable in quality, like the CN's, ranging from "Fuck" - like to "Wheeeet" - like. Most of the introductory notes to the songs between A and B during this performance were on the "Fuck" - like side.)

The bill is opened and closed (partially) with the notes of the song, except during the "freeeeeeee" part, when it is kept wide open, probably vibrating a little but very rapidly. The tail definitely vibrates very rapidly & conspicuously, up & down, during the freeeeeeee "

All the songs during this performance by A & B, and all other songs I have heard, are given from quite unvirtually sitting postures. Never even associated with preening or anything else — although both A and B sometimes stopped very briefly, in the midst of their activity, to pick and eat a berry.

The performance between A & B was very long-sustained, the two birds going back & forth and around what seemed to be a fairly limited territory of approximately 300 yds diameter It was noticeable that A was usually perched well above B, and definitely seemed to be trying to maintain this position.

Eventually one of the birds disappeared. Whether this was B, leaving A in "possession of the field" A then perched on a bare twig on the top of a fairly tall bush (probably 15 ft off the ground) and sang repeatedly for a very long time These songs were definitely quite different from those which were given when B was around, insofar as the "freeeeeee" was usually almost or completely lacking. Its

place was taken by a brief "Jeee" note, without any rattling qual. ity. (This "Jeee" may be the correct interpretation of the "freeeee" but I can't be sure of this.)

I shall call the songs without "freeeeeeee" S, and the ones with "freeeeeee" SR (I don't think I shall continue to call the "freeeeeee" itself CN Trill, as I did on earlier days, as I don't think it is necessarily very closely related to the CN Trill's of the Plain-colored Tanagers.)

A gave S's remarkably frequently for quite a Long time after B left. Averaging 12 a minute (or slightly more) for at least 5 or 6 minutes.

This behavior is difficult to interpret as neither A nor B did anything overt whose significance was immediately clear, but I think that the reactions between A and B probably contained a hostile component, and that the SR is largely or completely hostile. (This is what one would expect from the R sound alone.) The S probably does not contain a hostile component. (Might be due to thwarted pairing drive ?????) In any case, the SR - S complex would seem to be strictly comparable to conventional oscinine song of the Muscicapid type.

I don't know whether A and B were rival males, or a ♂ and ♀ at an initial stage of pair-formation. I think probably the latter, as later on "another" bird, which may have been B again, showed up near A, and they went through the whole complex SR performance again.

The hostile nature of the SR is also indicated by the fact that when A was alone and heard other Buff-throated Tanagers singing in the distance, it

flew several yards in other direction, and began to utter SR (it had been giving S before this).

I also saw a nice, mixed up performance involving 4 or 6 birds, with lots of SR with particularly long R, which may have been territorial defense involving 2 or 3 pairs.

Chlorospingus, I March 5, 1959
Cerro Punta

Watching the same birds as yesterday.

Behaving much the same as yesterday. (I watched A quite a bit. It was back at the same old station, but not very active. so I switched most of my attention to A's neighbors.) A lot of apparently solitary unmated birds (♂'s?), each staying more or less in its own fairly limited area, giving S when alone, and switching to SR when a stranger appeared or a neighbor came fairly close. Whenever two birds came together, one (and often, at least, both) would utter lots of SR with particularly long R.

Only a few points of interest.

One apparently solitary bird gave SR phrases mixed of S, although there were apparently no other birds audible in the distance. But these SR's were not very rapidly repeated, and were short, i.e. the R part was short

One when two birds (neighbors?) were hopping excitedly back and forth, uttering lots of SR with particularly long R, one of them definitely peeked at the other. During a similar, earlier performance, I didn't see any actual peeking, but the two birds

hopped and/or flew back and forth so excitedly that it looked very much like real fighting.

During another incident involving two birds, one of them flew & hopped excitedly near the other. This active bird uttered nearly continuous SR phrases, with very long R. The other bird just sat, apparently not moving at all, with its back toward the singing bird! I think this passive bird was quite silent throughout. It looked very much as if a ♂ were being visited by a ♀; the ♀ sitting quietly throughout the male's initial strongly hostile reaction. This suggestion would seem to be confirmed, indirectly, by the subsequent course of events. The active bird, the presumed ♂, eventually flew away from the passive bird, and flew to the border of the neighbor's territory and engaged in a long mutual SR performance with this neighbor. It looked very much like redirected aggressiveness. The original passive bird followed the active one and soon hovered around the edge of the subsequent "dispute", but unfortunately I couldn't follow them any further.)

One solitary bird uttered 3 or 4 particularly loud & long "Whee" CV's before flying away when frightened by the approach of a large truck. Good evidence that such CV's contain a relatively strong escape component.

Chloroquiques, I. March 6, 1959
Cerro Punta

Watching the same birds again today. Behaving much as before.

Lots more clearing back & forth with SR with particularly long R parts.

At least one pair mated & possibly two, had definitely acquired mates by this morning. The usual behavior of an apparently mated pair was as follows: The 2 birds moved through their territory nearly continuously, the pair with ♀ following the pair with ♂, usually rather closely, either one or both birds stopping to feed from time to time. The ♂ gave S's, or SR's with relatively short R parts from time to time, usually or always when he had become slightly separated from the ♀. The ♀ was usually or always quite silent, as long as the birds were undisturbed on their territory.

When the pair encountered an intruder, or decided that a neighbor had come too close, the ♂ of the pair usually to engage the intruder in a long SR, with long R, battle, without or without actual clearing back & forth. The ♀ of the pair usually followed after her ♂, sort of hovering on the outskirts of the dispute. She never gave SR like the ♂ during the disputes, but she did give an occasional S, or a few-CN's like those which usually introduce the S. Her vocalizations were always much less frequent than those of the ♂.

Bartta saw an interesting performance while I was gone. A bird (♂?) giving S's in the usual way. Then uttered a few soft notes, in a more or less normal sitting or standing posture but with wings stretched out horizontally! Bartta would translate the notes as "Pee pee pee." He thinks they were uttered in series of 3, and that the series was repeated at least once. Then he saw there was another bird present, some distance away from the performing bird, in the direction in which the performing bird was facing. This

may have been a ♀, if the performing bird was a ♂. Unfortunately, however, this behavior didn't seem to lead to anything.

This afternoon I finally managed to see some footy-capped Bush-tanagers (pileatus = [illegible]).

At least two birds. Probably a pair. They hopped about in the bushes close together, without any sign of hostility. Uttering occasional single "Tsit" notes, probably more abrupt than those of the common Brown-capped Bush-tanagers. Dail a very-feeders probably dealt with those of the latter species. Equally active in general.

There seemed to be one or more other Bush-tanagers in the neighborhood, so it is possible that this pair of footy-caps was part of a flock (There were also some warblers and a Yellow-thighed finch in the immediate neighborhood, but I doubt if the assemblage could really be described as a "mixed species flock", as the other species soon moved on in their separate ways.)

At one time, one or both of the footy-caps was provoked into giving a burst of song phrases. I couldn't really see what started this off, but I think that it was probably another Bush-tanager in a nearby bush. The song of this species is quite different from that of the Brown-capped Bush-tanagers, although the actual physical quality of the voice during the song is really quite reminiscent of the latter. A typical song phrase of the footy-caps I watched today might be transcribed as "Tut tut tsewee tsewee tsewee" There were definite pauses between the "tut" notes, and also between the second "tut" note and the first "tsewee", but the rest of the notes followed very rapidly one right after the other. The whole phrase gave the impression of being an accelerating performance. The rhythm might be repr-

esented commences: — — ~ ~ ~ — ~ Several times, at least 3 whole phrases were repeated one right after the other. They were all given from unrituralized sitting, standing, or moving positions, just as in the Brown-cap.

It is possible that some or all of "tsewee" notes of this song had a slightly buzzy or rattling undertone. It is also possible that these birds uttered some long notes much more like the R of the Brown-cap; but I couldn't be sure of this. (They were all uttered far back in the bushes, where I couldn't see the birds.) If the notes I heard were uttered by the hooty-caps, then they were definitely more buzzy, and less rattling (with less well separated "vibrations") than the R of the Brown-caps

This afternoon I also saw a dispute between 2 Brown-caps in which an aggressive bird definitely gave SR with very long R immediately before making a supplanting attack upon an opponent.

I think that the basic nature of the R's of this species is pretty well established now. (One might suppose that the SR's were merely higher intensity performances than the S's, were it not for the fact that solitary ♂'s can give such long series of S's, with little or no R, in such rapid succession. These latter performances appear to be quite high intensity. So the difference between S and SR is almost certainly qualitative rather than quantitative.)

Chlorospingus, I March 7, 1959
Cerro Punta

I have seen several more cases of SR with long R leading to

prolonged aerial chasing.

I think I have got one problem straight now. As I mentioned above, Sep. 19, 1958, p. 3, flying birds may utter an "R" sound which seems to be very much like an accelerated series of CN's After watching the birds a lot now, I am fairly convinced that this sound uttered by flying birds is not a series of CN's. It is not uttered when the birds are flying about more or less peacefully; only when they are flying during (or in association with) a dispute. I am now convinced that this aerial sound is closely related to the R associated with S. It sounds like an R during SR which has been slightly slowed down It might be described as a series of very rapid "tuk tuk tuk tuk tuk ....." notes. The slowing down of these notes, in comparison with the R of SR, may be due to nothing more than the physical effect of flying movements

The ♀'s of mated pairs are definitely capable of uttering complete S's and even SR's with out R. I think one ♀ I watched today gave these songs whenever she got too far away from her mate (It is just barely possible, however, that they may have been provoked by a neighbor I couldn't see.) It is still quite obvious, however, that ♀'s sing much less frequently than their mates

This seems to be about the most common "singing posture" during a dispute. It is largely a pre flight posture A solitary ♂ singing by himself usually sits more erect

Alboraphiques, Mar. 17, 1959, II. (18)

I caught another Brown-cap in my net today, and again it was silent when handled

Although the flocks of Brown-capped Bush-tanagers seem to be quite developed now, one can still see evidence of their relative to highly gregarious nature. The territories of the males & pairs seem to be quite small. I have been making most of my observations along a stretch of highway approximately 100 m. long, and there seem to be at least 6 territories along this stretch (on both sides). And it is obvious that whenever one bird gives S, one or more of its neighbors usually gives S or SR in response; and that whenever one bird gives SR with long R, all its neighbors usually respond by giving SR, usually with long R also. The sound of a dispute between 2 birds, lots of SR with long R, often stimulates neighboring birds to begin disputing also, either joining the original dispute (if the lay-out of territories is suitable) or starting a little dispute among themselves. This is the sort of thing from which a communal territory display like that of the Swallow-tanager could easily develop.

Alboraphiques, I March 6, 1959
Cerro Punta

Another possible example of ♂ — ♀ behavior at the beginning of pairing. We watched 2 birds hopping & flying all around what seemed to be a territory. The bird that was usually leading (♂?) gave nearly constant SR with long R, particularly when the following bird came especially close. Surprisingly enough, however, "be" often faced dir-

ality away from the "♀" while he sang, especially when she was particularly close to "him" It looked as if "he" wanted to attack "her", but was prevented by an inhibition of some sort. The "♀" quit following "him" around, silently most of the time. Only once in a while did she utter a brief S or SR with short R — always, I think, facing in the direction of the "♂"

The shortest "complete" form of S might be transcribed as "Tsit tsit tsit tseeeyou" (the preliminary 3 notes being very rapid)

I have now seen so many cases of apparently solitary birds quie SR with short R, when there aren't any obvious disputes going on in the neighborhood, that I think that this may be the "normal" high intensity form of song. Perhaps only the SR's with long R are more aggressive than the usual song.

Perhaps surprisingly, none of the Brown-capped Bush-tanagers I have been watching on this trip has shown the slightest tendency to join up with the mixed flocks of Wilson's Warblers and Redstarts moving through their territories. Not even temporarily

Chlorospingus, I March 9, 1959
Cerro Punta

Yesterday, we watched a mixed species flock at an elevation of approximately 7000 ft. This flock seemed to be largely based upon Collared Redstarts. It also included Slate-throated Redstarts, Wilson's Warblers, Yellow-thighed Finches, at least one Yellow-throated Chlapetes, and one Ruddy Treerunner (Margarornis

rubiginosus). Also in this flock were 4 small birds which we had great trouble in identifying. They looked like Eisenmann's description of footy-capped Bush-tanagers — except that the white streak on the head was definitely supra-ocular! I thought that they must be finches or warblers, but checking this morning (see below) we discovered that the birds I called footy-capped Bush-tanagers on Mar. 6 were certainly the same thing. So I guess that these birds in the flock must have been footy-caps after all!

In this case, their behavior was most interesting. They were relatively very silent most of the time. Only uttered single little weak "Frit" or "Whit" CN's occasionally as they moved through the bushes. One bird once uttered an accelerated series of 3 or 4 of these notes when making a relatively long flight to a rather isolated tree. (The existence of these faint-sounding CN's would suggest that the louder & more emphatic CN's I heard on Mar. 6 were alarm CN's.) Otherwise relatively quite silent. This comparative silence would seem to be significant, in view of the fact that the birds were non-territorial. The behavior of the territorial birds I watched this morning was quite different (see below).

Nevertheless, at one time, a fight apparently broke out between 2 or 3 of these birds, low down in a bush where we could hardly see them. Accompanied by definite HAC of the usual tanager or finch type.

I also got a chance to study the flashing of these birds in the mixed flocks. The WF's were very frequent & quite extreme. The TF's were also very frequent but much less extreme. Definitely lateral, appearing to be little more than a continuation of the

pivoting of the body. There was a definite U-D component in some cases, but this was not really visible all the time.

This morning we watched some (apparently) other Footy Capped Bush-Tanagers. A pair and a 3rd bird. The pair was apparently the same as the one I watched March 6 (one of the birds was individually recognizable because it had an interrupted white line on one side of the head). Most of the time there seemed to be some hostility between the pair and the third bird. The pair were in approximately the same place I saw them on March 6, and I presume they were defending territory. In any case, one of the birds of the pair (and quite possibly both) was extremely vocal throughout the relatively brief time we watched them today. Lots of song. This seemed to consist of little more than a series of "Tsewheet tsewheet tsewheet tsewheet" notes, usually 3 or 4 or in number (I don't think I ever heard more). This was associated with a lot of R's, apparently quite like that of the Brown-cap in actual sound. The interesting thing was that this R of the Footy-cap seemed to be much less closely integrated with the "Tsewheet" song than the corresponding pattern of the Brown-cap. It occurred by itself alone, or (quite frequently) before a series of "Tsewheet" notes, or after such notes, or between series of such notes. The R's seemed to be most frequent and most prolonged when the dispute was apparently most intense. According to Barth, who got a better view of the birds than I did, a bird once sat on a twig in an unwithdrawn posture while giving the R.

Oloroquinqui, I — March 13, 1960
Cerro Punta

Found a pair of Sooty Capped Bush-Tanagers, today, at about 7000 ft. above Cerro Punta, in exactly the same place as last year. Definitely associating with, and following, a Yellow-thighed Finch.

While the 2 Sooty Caps were moving about in the bushes, they uttered CN's almost constantly. "Trit"s. Sung-lets or doublets in quite irregular rhythm: — — — — — — — — — — etc.

The species also seem to have a distinct flight-call note (FCN). The FCN's can also be transcribed by something like "Trit", but they are lower & longer (and probably louder), and more evenly arranged, than the ordinary CN's. Thus: or ten commas:

— — — — — — —

When the pair were in the bushes together, one suddenly started to utter FCN's, and then flew across an open road, uttering FCN's throughout the flight. The other remained behind for several seconds, uttering FCN's while it remained in the bush, and then flew across the road to join the first bird. The second bird also uttered FCN's throughout the flight.

A pair of Brown caps eventually showed up in more or less the same neighborhood as the Sooty caps. It was then very obvious that the Sooty Caps utter their CN's much less frequently than the Brown-caps, although the CN's of the Sooty Caps are actually common & frequent. This would certainly suggest that the Sooty Caps are less specialized in connection with the gregariousness, than are the Brown Caps.

Chlorospingus, I. March 20, 1960
Cerro Punta

Watching forty Caps this morning at the same place as yesterday. Probably at least 2 pairs in the neighborhood

Didn't see much, except one peculiar incident. One bird, apparently alone, was "attracted" by a flight between two Yellow-thighed Finches. Flew over to the area where the Yellow-thighed Finches were being so noisy, and then began to "sing." Its song was never reminiscent of the SR song of the Brown-caps. With definite rattles (might be transcribed as "Tsit tsit tsit tsrrrrrrrrrrrrrrr" Occasionally a little "fleeuu b" at the end. Tsit tsit tsit tsrrrrrrrrrrrrrrr

Often from a perfectly unmistakable perched, except, when it was singing most vigorously & rapidly, a definite trace of ♀ during the R part. The bill was opened & closed with each "Tsit" note, and kept open throughout the R. Later on, when the bird appeared to have become calmer, and was singing less frequently, it gave absolutely similar SR-type songs without any ♀ during the R part.

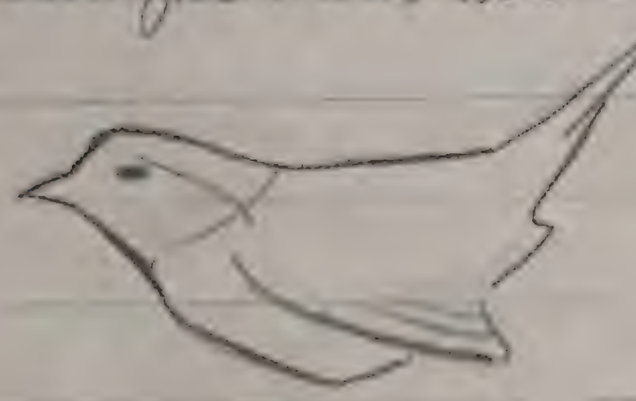
SR + ♀

Again noticed that this species is somewhat less noisy than the Brown-cap. A bird of this species may also sit quite stately for minutes on end — sometimes I don't remember ever seeing a Brown-cap do.

Atlacomulco, I March 21, 1960
Cerro Prieto

Not a good day today — too windy
We did see one interesting encounter, however. One of 7 (?) uttering SR after SR near another bird. This second bird only uttered a few SR's in reply. A third bird was some distance behind the second, and also uttered a few SR's. Eventually the second bird flew off (and the third bird seemed to disappear at the same time). The first bird waited intently, full silent, and didn't sing again during the rest of the time (ca 3 min.) we watched it. I presume the first bird was a territorial ♂ defending his territory against an intruding pair.

Next (but not all) the R's of this period ♂ were accompanied by ♀. One yesterday. This is interesting, as ♀ would seem to be defending territ in other species. I also noticed that each time the bird performed ♀ it tended to wave the tail quite conspicuously! It would appear that this species has managed to incorporate some originally pairbond sexual patterns into its territ repertoire!



SR + ♀ + tail waving

Watched several groups of Brewer-caps this afternoon, just at the altitude of Cerro Prieto. It was a very cold rainy afternoon, and the birds seemed to be almost incompletely gregarious, moving about in little flocks of 4 or 5 or (pooled) more.

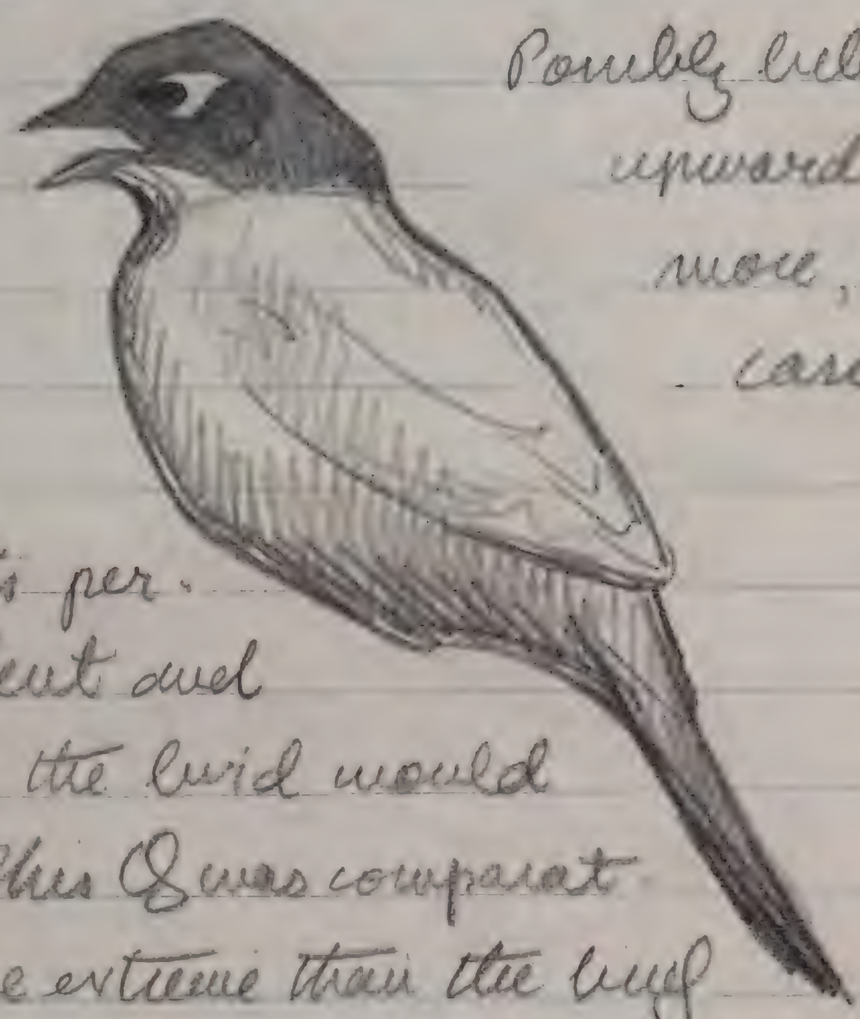
One bird, however, stayed in the same place for at least several minutes, and sang repeatedly. Both ♂ and SR ♀ heard both ♀

the Sears, and noted one feature I rather overlooked before. Both S and SR usually end with a "towsyoo" or "bee boo" which is different. Great variation in pitch. The transcription of S on Sept 20, 1958, p. 5., is otherwise quite good.

SR should probably be transcribed by something like "Jauck Jauk Jit Jit jit sreeee

Chiricahuas, Mon. 24, 1960 (26)

itself on an electric or telephone wire. Uttering repeated single CN's for minutes on end. In very regular rhythm. — — — — —
They were rather "Zit" CN's or something very, very similar. (I rather thought that the first notes I heard were slightly softer & coarser than the ordinary "Zit" CN's, but the later ones seemed to be quite typical) The bill opened & closed with each note. The accompanying posture was rather distinctive. The bird looked relatively very small-headed & square-headed.



Possibly bill pointed upward a little more, in some cases.

Every once in a while during this performance, both when it was silent and when it was uttering a "Zit", the bird would perform a brief burst of Q. (This Q was comparatively slight; but it was far more extreme than the brief trembling of the wings which frequently or usually accompanies R — see below.)

A continued this performance for almost a half hour. With only very brief interruptions (apparently to pick up a berry or an insect). Each time it flew off to feed it returned almost immediately, to the same place on the wire, or to some other spot on the wire no more than 25 yds away. It appeared to be almost strictly confined to a limited area.

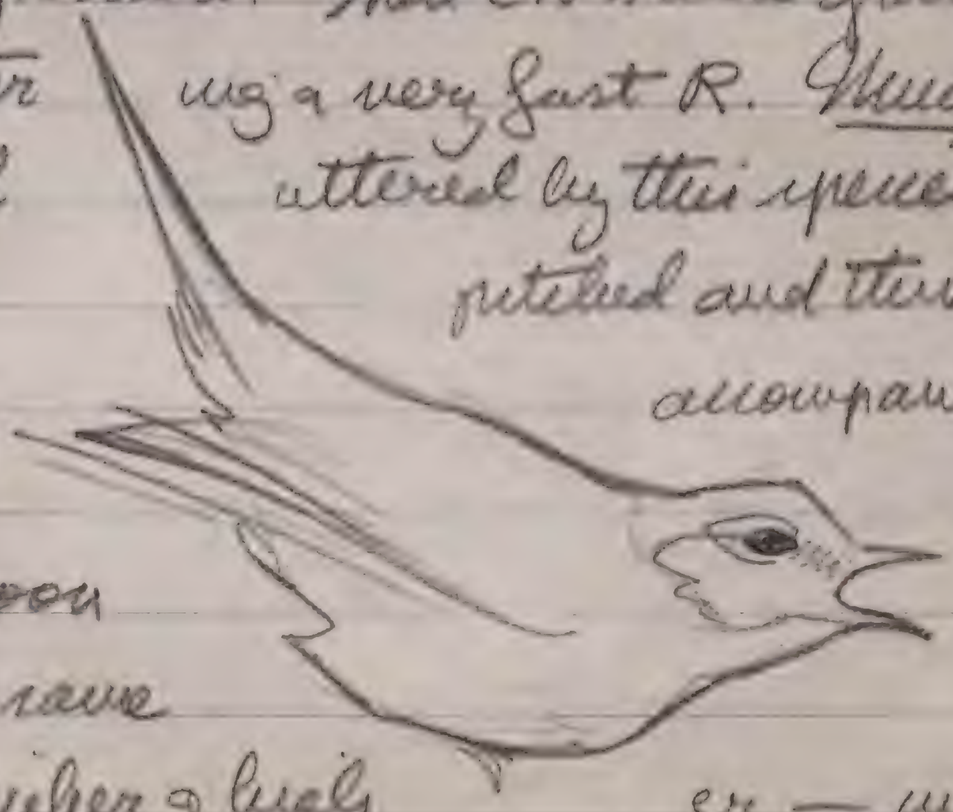
I should not be surprised if A were a ♂, and that he was "calling a female" during this "Zit" - Q performance this morning.

At the same time that A was giving this performance, we could hear

several other birds within a few hundred yards uttering similar "Dit" notes.

About 7:00 a.m. All or most of this "Dit"-ing stopped. Many of the birds then began to utter novel, bell-like sound SR. This gradual shift might suggest that "nipping" is a lower intensity reaction than "Dit"-ing. It is also possible (perhaps more probable?) that "Dit"-ing & includes a stronger pairing component (and male-female hostility?) than nipping.

At just about 7:00 a.m., before nipping had reached its peak, one bird performed an extremely interesting & rather puzzling reaction. This bird was probably A also. It was in a bush, without any other bird very close by, when it began to utter CN's (there were probably "Dink" CN's — see below) At first in a perfectly normal sitting posture. Then CN's were gradually accelerated until the bird was uttering a very fast R. Much faster than any R I have ever heard uttered by this species before. Becoming increasingly excited and this - rounding as it continued accompanied by very extreme and



& (which began as the R really got going) the tail was g
ed. This was long-sustained (just about as soon
at the rare usually sang) all the rare
er — until it reached approxi
mately the position shown in the accompanying drawing. The whole performance then stopped abruptly, and the bird relaxed without doing anything further. I simply could not tell what provoked this performance. During the whole performance, the bird was facing another bird 10 or 15 yds away, who appeared to be a neighbor. So it is possible that the whole thing was eventually or purely hostile. In any case, the neighbor

paid no attention to the performance. It just continued to feed normally.)

The transition between "Trit" wig + ♀ and ordinary wigwig was quite gradual, and all or most birds continued brief periods of "Trit" performance some time after they had uttered their first songs. I managed to see A perform one of these latter transitions between "Trit" performance and wigwig. He was sitting alone in a bush, uttering many single "Trit" CN's. Sitting in more or less the same posture as shown on p. 26, but without any ♀. Some of these "Trits" then became the initial notes of a song phrase. Apparently always S at first. The transition was more or less comme ça:

"Trit Trit Tritseeyoo Trit Trit Trit Tritseeyoo Trit..."

Running single "Trit"s between each song phase at first. After a while A began to insert SR's, with short R bits, instead of pure S's, into this "Trit"-wig.

(It may be significant, incidentally, that the single S's, rather than SR's, appeared first during the transition between "Trit"-wig and wigwig. This might indicate that the "Trit"-wig is not hostile.)

Once the wigwig really got started (in the group as a whole), it was much the same as last year. SR's with particularly long R's during territorial disputes. Pure S's when overt hostility was at a minimum. ♂'s tending to do more S's and especially SR's with long R's than ♀'s. Etc. Etc. Etc.

I can add a little to my description of the song patterns. By no means all the songs, particularly not all the SR's, end with the "hee hoo" or "tseeyoo" flourish described above on Mar.

21, 1960, p. 25 Most (but not all) rougs may have two notes in their position, but they are by no means always very different in pitch. The R bits usually (or at least frequently) sound like accelerated "Juck" CN's rather than other types of CN's. As noted last year, the tail frequently vibrates in rhythm with the "syllables" of the R, and I noticed today that the rougs also vibrate in the same rhythm at the same time. But this vibration of the rougs is always much less extreme than real Q.

The R + tail-up (which I shall call TV) + Q of A today was most reminiscent of the SR performances of the Sooty-Caps. But it is obvious that the Q of the Brown-Cap only occurs at much higher intensity than the Q of the Sooty Cap in similar circumstances

Perhaps one of my statements above should be qualified a little. I watched a lot of rather prolonged territorial disputes during which one or more of the birds involved uttered many SR's with long R's. None of these R's was as extreme as the R uttered by A with TV + Q — and none of them was accompanied by the slightest trace of either TV or Q. So perhaps A's R-TV-Q performance did contain a warning element after all.

Most of the birds which appeared to have territories today were apparently single. But there was also at least one well-mated pair defending territory in the area.

As a result of general observations of Brown-Caps in a variety of areas from above Cerro Punta to just above the Llanos, I have received the impression that many birds (probably nearly all ♂'s) go to their territories, and defend their territories, and display on their territories, early in the morning, and from time to time during the rest of the day, (especially in the late afternoon), and then revert to more or less

gregarious non-territorial flocking behavior in the intervals (this is presumably an indication that the breeding season is not greatly advanced yet. Perhaps the birds have been delayed, or set back, by the cheerful rainy weather we have been having recently.)

This morning the singing of all the birds in our area had greatly declined by 8:00 a.m.

David may have observed a transition between territorial & flocking behavior. One bird (probably A again) sat relatively quiet & uttering "Jit" CN's with occasional Q. In a bush, not far from the place on the wires where it displayed earlier. Then another bird approached. Both A and the newcomer started to utter "Jurk" CN's (David thinks that A started to give "Jurk" CN's before the newcomer.) Then they began to chase one another, not very energetically, A probably being the chaser more often than not. Both started to sing (probably SR with short R) at one time when they landed together on the same branch after a long flight. Thus chasing stopped after a while. Both birds began to feed peacefully, uttering "Jit" CN's, without Q or other ritualized postures or movements from time to time.

When I came down to see the same birds, they were still feeding peacefully more or less together. Just uttering simple "Jit" CN's from time to time. Twice one bird (A?) flew a short way toward the other, uttered "Jurk" CN's just before and during these flights. In actually flying, the "Jurks" were sometimes accelerated to form a "semi-Trill", like the semi-Trills described above on Mar. 17, 1959, p. 17. These little flights with "Jurk" CN's did not develop into actual attacks. Both birds resumed feeding peacefully with or without "Jit" CN's almost immediately.

A few minutes later, there was a third bird feeding peacefully in

the close vicinity of the other two!

The species obviously has at least 3, and probably 4, different types of CN's. One is the "Tuck" CN, in which attack is presumably slightly predominant. The second is the "Jit" CN, in which the battle drives may be balanced. The third is the "Wheet" CN, in which escape is presumably predominant. Both the "Tuck" and the "Wheet" seem to intergrade with the "Jit". The CN's with "Aurk" undertone may be related to, or variations of, the "Tuck".

Chlorospuigues, I. March 25, 1960
Cerro Puerta

We looked for the Brown-Caps by the peat bend yesterday afternoon, but could hardly see any at all until late in the evening, when some birds re-appeared on their territories and got engaged in territorial disputes. I think that they were just being inconspicuous — certainly not going around in large mixed flocks. I would not be surprised, in fact, if some of their birds had incubating females hidden away somewhere. Time will tell I suppose.

A is certainly very highly motivated, however. Almost certainly engaged in pair-formation (or pair re-formation).

When we arrived at his territory early this morning, around 6:00 a.m., he was sitting on the wire again, uttering constant "Jit" CN's, with occasional &. Essentially just like yesterday. I did notice some more details of the posture during this performance, however. Not always as fluffed as yesterday. Usually A's body is fairly erect while he is uttering the "Jit"s, but sometimes, especially just before a jit after flights, the body is almost horizontal. Usually he keeps his legs

2 Extreme Postures

fairly well extended — so that he is technically standing rather than sitting on the wire.

Sometimes he uttered a doublet, a pair of "Tsit" Notes very close together, with the middle of a series of otherwise uniformly spaced single "Tsit" Notes — — — — — — — — —

He did not seem to be significant of any change of motivation

Once or twice, when another bird came within 25 yards or so early this morning, A increased the vigor & amplitude of his S movements quite appreciably, without stopping "Tsit"s or changing his posture or moving toward the other bird.

As was the case yesterday, A was almost finished with his "Tsit" — S performance by 7:00 a.m. Taking off for longer & longer periods, presumably to feed. When he did resume "Tsit" - S - ing after a period of feeding, he usually began to interject more songs, first S alone and then both S and/or SR. This interjection of song occurred in the same way as yesterday. (When A did resume uttering "Tsit"s for brief periods after 7:00 a.m., I noticed, today, that he also tended to resume S as before.)

David noticed one feature of the S's of A which I had completely overlooked before. All or most of his S's could be numbered by

sometimes like "Jrit Jrit Jrit Jroowee" — — — ~
or — — —

(The first notes are really just ordinary "Jrit" CN's.) The "Jroowee" at the end is just the opposite of the "Jreeyoo" which I thought was typical. It is possible that these "Jroowee" performances of A are really different calls from what I previously identified as typical S. But I doubt it. I think I just made a mistake earlier, or that the differences are purely individual variation (One other bird, at least, in the neighborhood of A, uttered S's which also usually ended with "Jroowee"s.)

Most of the R's which A utters during his SR's do not seem to end with any flourish of notes of distinctly different pitch. Another bird in the area does, however, usually end his SR's with a "Jreeyoo" or "Hea hoo" just as I have described it above for perhaps the "Jreeyoo" is typical of SR's and the "Jroowee" of S's ?????

There was a period of fairly heavy rain shortly after 7:00 a.m., which seemed to inhibit all display by all the birds. When it stopped, ca. 7:30, we heard a great outburst of R's from A's territory. We could not see the bird(s) uttering these R's while the performance was going on, but later they revolved themselves into A and a visitor, probably a ♀, probably more or less wanted to hair. These R's sounded exactly like & very similar to the R's A uttered yesterday during his R-TV-S performance. Right? (Some of these may have been somewhat slower in rhythm than the R during the R-TV-S performance yesterday.) They sounded as if they were being uttered by only one bird. In any case, there must have been at least 15 or 16 R's one right after the

other showing this single burst. (As a further similarity to the R of the R-TV- ♂ performance yesterday, it should be mentioned that all the R's showing the burst today came from exactly the same spot I.E. the bird(s) uttering them must have remained completely stationary.)

I think that I shall call these high, thin extreme R's, "ER".

I noticed today that the ER's develop from accelerated "Jit" CN's rather than "Jerk" CN's

When the burst of ER-ing was over, A and the ♀ emerged from the tangle in which they had been hiding themselves, and then began to hop & fly through the bushes & trees at a rapid rate. Lots of R's, SR's, "Jerk" CN's, little chases, etc. All this looked very much like the hostility between presumably newly mated birds that I observed last year. The presumed ♀ certainly stayed around A for well over 15 minutes, but then she seemed to disappear, and A almost stopped display completely. All A appeared to be doing was defending his territory against neighbors from time to time.

(One thing I forgot to mention above. A certainly has a definite preference for high exposed perches on which to deliver his "Jit" ♂ displays early in the morning. His morning, when he was not performing on the telephone or electric wires, he always chose a relatively high & completely dead & bare twig or branch.)

By a good deal of extrapolation, it might be possible to reconstruct the early pairing behavior of this species as follows. The ♂ advertises for a female by "Jit"- ♂ performances on very conspicuous places in his territory. Some or all S's may also be used as advertisement. When a ♀ appears, she is first greeted by ER-TV- ♂ performance. This is followed by chases, SR's, R's, "Jerk" CN's, etc., until the ♂'s hostility has declined sufficiently for him to accept the ♀ fully.

I have several times seen a single Brown-Cap fly down to the ground and stay in the grass for at least several minutes. All or most of the birds that did this were birds that I thought were ♀'s. This might suggest that the specimens on the ground ??? Evidence of relationship to Buck-Spiders ???

Watched Sooty Caps this afternoon, from ca. 5:00 p.m. to 6:30 At first they were very inactive. The only interesting thing we saw was a single bird which appeared to have become separated from its mate. It sat on a perch for a long time, and then hopped about for a while, coming on several perches for some minutes, uttering "Jit" CN's almost all the while. Single notes, uttered in rather regular rhythm, not very fast. All very reminiscent of the "Jit" performances of the A Brown-Cap early in the morning. But the Sooty Cap did not ♂ during its "Jit"s.

I should mention that when we first arrived at Cerro Punta this trip, before the great rains, when we could still go up the mountain without much trouble, we were up in the Sooty Cap area twice shortly after dawn. Each time we saw a single bird spend several minutes perched quite completely out in the open, on the tops of one or more dead trees. This was quite reminiscent of the A Brown-Cap's habit of sitting out in the open early in the morning to perform its "Jit"-♂ patterns. But the Sooty Cap we watched definitely did not perform any "Jit"-♂ patterns. Just sat absolutely still for minutes on end, and then flew off to join its mate.)

I think that all the Sooty Caps in the area in which we have been working are mated. We have been paying particular attention to ♀ neighboring pairs.

We saw quite a lot of courting behavior late this afternoon, just around sunset. Correlated with the formation and subsequent un-

audience of a mixed flock (see David's Notes). A mixed flock formed about this time, including one of the pairs of Sooty Caps (which I shall call pair "V"), a pair of Yellow-thighs and various warblers. Wandered quite happily around the territory of pair V, until it came to the boundary of the other pair (which I shall call pair "D"). This boundary is a somewhat clearer area of scrub-separating two areas of very thick scrub. This is also the approximate boundary between the territories of two pairs of Yellow-thighs — see today's notes on Psellioptiones. When the mixed flock reached this boundary, a furious & prolonged dispute broke out between the V and D pairs of Sooty Caps. This is usual in such circumstances, I think. It may also be significant that I have never seen more than two Sooty Caps with a mixed flock at a given time — unless there was obvious fighting going on. This would indicate that a pair of Sooty Caps (like pairs of Yellow-thighed Finches) only attaches itself to a mixed flock while the flock moves through its territory. When the flock moves on to the territory of another pair, the Joint pair of Sooty Caps may try to follow, but will soon be driven out by the owners of the territory. At least during the breeding season.

It is becoming fairly obvious that the Sooty Caps are almost as completely "nuclear" in the mixed flocks high up the mountains as are the Brown-Caps in the flocks lower down.

The fight between pairs V + D was very prolonged, and ranged along the border of their territories and well inside the territories of both pairs. Lots & lots of threat displays and supplanting attacks.

The commonest displays were "Fit" CN's. Usually single, although often rapidly repeated. 6 or 7 "Fits" were sometimes accelerated into a rattling like a CN-Fell when a bird flew. I could not detect any

morphologically distinct type of CN like the "Jeek" CN of the Brown-Caps. (The voice of the Footy-Cap is generally much softer, thinner, and possibly slightly higher pitched, than the voice of the Brown-Cap. This difference is reflected in all the calls of the two species. It is possible, therefore that the Footy-Cap does have a note which is strictly homologous with the "Jeek" CN of the Brown-Cap, but that it is too subtly differentiated for my ears to distinguish it.)

Probably the next most common call during this dispute was R. R's of all lengths, sometimes following immediately after "Jit" CN's. This sequence seems to be what I called SR on previous pages (see above). Also frequently uttered by themselves alone (as far as any notes could be uttered alone during the frantic jumble of all sorts of calls & notes during the height of this dispute.) All or most R's, at least the ones that were even moderately prolonged, were accompanied by S, and (sometimes at least) a trace of TV.

Another very common call was one I know I have heard before this year, but rather overlooked. It is a more or less 3-note pattern (sometimes the 3 notes are quite sharply separate from one another, and at other times they run into one another). This call might be transcribed by something like "Jree-weea-yoo" or "Jre-wee-yoo" It may well be strictly homologous with the 3-note pattern which seems to be the core of the S of the Brown Cap, i.e. the "Jit Jroowee" and/or the "Jit Jreeyoo".

It is quite possible that I shall have to drop the terms "S" & "SR" in my descriptions of both Chlorospizas. It may well be preferable to use such terms as "Jit"s (& the other types of CN's) and R (& ER). If it becomes desirable to use a term for the 3-note patterns accented with "song", I shall use "NNN".

The NNN's of the Footy Caps often followed immediately after a series of "Juts", Comme ça: "Jrit Jrit Jeeweeyoo." Also frequently "independent". Also frequently annotated with R's. In the latter case, the most common sequence was: "Jrit"s — NNN — R. This is quite a big difference from the usual SR of the Brown-Cap.

In addition, at intervals during this long dispute, one or more of the Footy Caps uttered longer notes which might be transcribed by something like "Jeweee" sometimes following immediately after "Jrit" CN's, and sometimes repeated. I am sure that I heard such sequences as "Jrit Jrit Jeweee Jeweee". This may well have been essentially identical with some "song" phrases I heard last year, e.g. the one described on Mar. 6, 1959, p. 15.

The R's of the Footy Cap are obviously aggressive, and its "Juts" are presumably low-intensity. Aside from this, I have not yet been able to begin analyzing the motivational differences between the various vocal patterns of the species.

Although many of the notes uttered by the Footy Caps during this long dispute obviously occurred in "ordered" sequence, I still think that the calls & notes of the Footy Cap can be arranged or re-arranged in more different ways than the calls & notes of the Brown Cap. (I must add that during this dispute the Footy Caps uttered quite as many notes, approximately as rapidly, as Brown Caps during similar disputes at a similar time of day.)

An apparently single Brown Cap joined this mixed flock several times during the period when the Footy Caps (and the Yellow-thighs) were disputing most vigorously among themselves. Twice it was obviously "attracted" by the songs of the Yellow-thighs. Each time it came rushing over to the flock, uttering "Duck" CN's and SR's as it did

no, as soon as the Yellow-thighs began to sing. Once it did this immediately after having ignored a whole barrage of "Jid" CN's, R's, NNN's, etc., from the frothing footy caps which were very near the Yellow-thighs!

This would indicate that this individual Brown Cap (at least) had a definite tendency to respond "positively" to Yellow-thighs. Such responses may be very important in maintaining the organization of mixed flocks.

It was also extremely interesting that this Brown-Cap responded more "positively" to Yellow-thighs than to footy caps. Quite surprising in view of the similar vocal repertoires of the 2 Chlorospingus species.

Only once did the Brown-Cap respond vocally to the footy-caps. This was very late in the course of the excitement tonight, after the Brown-Cap had spent a lot of time uttering "Jucks" & SR's in response to the singing of the Yellow-thighs. Then when the footy caps were being extremely noisy, with lots of CN's, R's, etc., the Brown Cap (who was about 10 ft away) also began to utter "Jucks", R's, etc.

At no time when the Brown-Cap was present, not even when it was being extremely vocal, did the footy caps pay any overt attention to it. They certainly did not respond to its R's and other hostile pattern vocalizations patterns of their own.

I presume that the lack of responses between the two species was largely due to the different volumes of their voices.

Still, it is obvious that the two species can only have retained their very similar display repertoires because their ranges are only very slightly sympatric. (This Brown-cap, and its probable mate, in this area where footy caps are predominant are actually the only examples of over Cap I have ever encountered here.)

Albuquerque, I March 26, 1960
Cerro Pelado

We watched Scott's Cap vireos high up in the mountains below the upper pasture. Arrived about 6:35 a.m.

At this time at least 3 different birds, belonging to different pairs, (presumably the males of the pairs), were sitting very exposed high on top of dead trees or branches. All remained there pretty steadily for at least ½ hour, usually Cowan. All of them remained absolutely silent throughout the whole performance. None of them performed the slightest trace of S. They just sat, usually looking fairly regularly from side to side, in an alert, even "nervous" manner. Usually sitting with body rather fluffed and head looking relatively small.

One bird at least (one of the birds of pair D) had two favorite "watching posts" which he alternated between. First he would sit on top of one dead tree for a few minutes, and then he would fly to the top of another dead tree about 25 yds away, and then he would fly back to the first tree, etc., etc., etc.

plus line of back is definitely correct

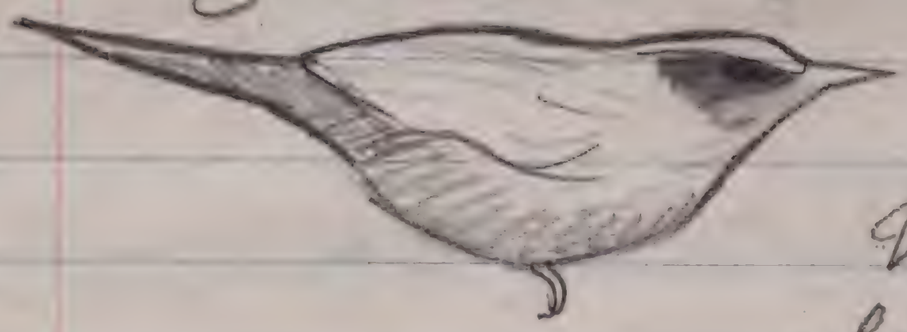
I cannot determine the function of this pattern. Perhaps it has a more obvious function when a ♂ is looking for a mate. At the present time it only seems to be helpful in territorial defence. The watching bird is in a good position to notice danger and/or intruders of rivals. This morning, when the birds of pair C trespassed into the territory of pair D, the one bird of pair D which had remained low in the thickets immediately began to utter hostile calls, CN's & R's, and the D bird sitting watching from the top of a tree

immediately flew down to help repell the intruders. Could then immediately returned to her watching post.

Although all the Sooty Caps here seem to be mated, they do not seem to be incubating yet.

We were struck this morning by the many similarities between Sooty Caps and Black-cheeked Warblers. The color patterns & size of the 2 species are approximately the same. The Black-cheek is just as active & noisy as the Sooty Cap; and some (at least) of its calls are very reminiscent of some calls (e.g. CN's, & R's) of the Sooty Cap. I should not be at all surprised if this turned out to be some sort of "mimicry." If so, it is remarkably detailed!

The best distinguishing marks of the Black-cheek are its shape, and the nearly complete absence of a white chin



Black cheek

Notice light cold, and the fact that the white superciliary stripe seems to be on top of the head.

We went up to watch the birds near the upper pasture again, without getting any very great results

One probable case of a Brown-Cap responding to CN's & R's of Sooty Caps by uttering "Jeek" CN's & R's of its own

Thus Brown-Cap uttered many R's, preceded by "Jit" or "Jeek" CN's, which might be transcribed as "Jreeeeeeeeeeeeeeyoo" The very slight "flourish" at the end of such R's may well have been an "indication" of an NNN, but it was certainly not well-developed. I think that many "SR"s of many individual Brown-caps may be similar in form.

Albuquerque, I. March 26, 1960
Cerro Punta

Yesterday afternoon we caught 6 Brown-caps at one time in the net, ca. 3 p.m., at a thicket right near Cerro Punta (where I caught all the Brown-caps my first trip here) They were in a flock of 7 or 8. So there are definitely some flocks around here now of the true

We watched the Brown-caps by the great bend in the road this morning.

A was back at his usual spot on the telephone wires, uttering "Jrit"s, at the usual time. His behavior was much as before, except that he Q'd much less frequently, and none of his Q's were quite as extreme as the most exaggerated ones he performed in the same minutes on previous days. I thought that once or twice when he Q'd he started to give a brief R, or "init. mov." of R.

Like the "watching" Sooty Caps early in the morning, A also did a lot of looking from side to side, "peering", during the period of his "Jrit"-Q performance. (I am sure that he also did this during the corresponding performances on earlier days — only I just overlooked it.)

A stopped his "Jrit"-Q fairly early this morning. Later on we saw him flying around with another bird.

A few minutes later he was back performing "Jrit"-Q's. At this time, we could hear (but not see) another bird uttering similar "Jrit"s some distance away, but still (apparently) in A's territory. A eventually flew away, apparently to join this other bird. We couldn't follow him, but there was definitely no sound of R or "SR" after he flew away.

We never heard any trace of ER today.

Everything would certainly suggest that A has found or refound a mate, and that he is now on good terms with her.

David watched another robin, bird, between 6:30 and 7:00 a.m., who behaved in somewhat the same way as A. Letting out a high pitched uttering "Tsit"s. These "Tsit"s may have been somewhat louder than the homologous notes of A; and this bird — which I shall call "C" — uttered them somewhat less frequently than A usually utters his "Tsit"s.) C apparently never performed the slightest trace of S during the period he was uttering "Tsit"s. Most of the time he was sitting quite erect — with his throat feathers flaffed out! This may yet possibly be an (or another) indication of relationship between Chlorospiza and Atlapetes. C was presumably motivated by much the same type of motivation as A during his "Tsit" - S performances, with some slight quantitative differences (relatively less hostility?) In any case, C eventually flew away to feed, and we didn't see him again before we left.

In case I have not made it clear in previous pages, the R of this species sounds as if it were composed of accelerated "Tuk "CN"s but it seems to be most often preceded by "Tsit "CN"s.

Chlorospiza, I. March 29, 1960
Cerro Punta

We watched one Sooty Cap chasing another. They ended up in a bush. We couldn't see them there, but the moment they landed there was a great burst of HAC notes. Presumably accompanying a fight (to it is fairly evident now that the HAC is a regular part of the upset

ay of the species. It is presumably higher intensity than the most aggressive R patterns.

All the Footy Caps we have seen this trip appear to be mated. We have seen little or nothing in the way of "courtesy" reactions between mates. They don't seem to have anything in the way of a real g.c., like the songs of some of the bush-finches. I suppose that the mates sometimes greet one another with R or some of the "SR" patterns, but this is always difficult to observe clearly. I have never observed mated Footy Caps utter R + unaccented calls and notes when I could be sure that the calls + notes were not produced by some third bird or some other "outside" source.)

It is also my impression that well-mated Brown-Caps do not have any special form of greeting either — in spite of the quite vigorous hostility between ♂'s and ♀'s during pair-formation + early pairing (see also last year's notes).

We caught 3 Footy Caps in the nets this afternoon. They struggled and tried to bite very vigorously (probably even more vigorously than the Brown Caps in similar circumstances). They were quite silent throughout, however. (This silence when handled may well be one of the more distinctive characters of the whole Chlorospingus - Atlapetes - Pselliophorus group of bush-finches and bush-tanagers.) The only "display" they did perform was a general erection of all or almost all the feathers of the head. This was most conspicuous in the case of the feathers of the crown, which are longer than the feathers of the rest of the head (although not elongated to form a special crest). I think this pattern can definitely be considered a form of ritualized CR.

Chlorophoenicus, I — March 30, 1960
Cerro Punta

One of the Brown Capped Bush-tanagers who seems to have a territory by the upper pasture here, and who had been quite silent for a couple of hours, suddenly began to utter "Tuck" CN's, R's, and NNN's, (usually arranged in the typical "SR" pattern of the species), when a Yellow-thighed Bush-finch landed on its territory and began to feed — in spite of the fact that the Yellow-thigh remained quite silent throughout the whole process! The Brown-Cap then "escorted" the Yellow-thigh to the boundary of its territory, following the Yellow-thigh at a distance of about 5 to 10 feet, continuing to utter "SR" o as it did so. As soon as the Yellow-thigh left its territory, the Brown-Cap immediately fell silent again. I am sure that this following by the Brown Cap was not feeding. It seemed to be territorial defense. In other words, the Brown Cap was reacting to the Yellow-thigh as if (or almost as if) the Yellow-thigh were another member of its own species!!! (Possibly the territorial Brown Cap would have reacted to an intruding Brown Cap by more prolonged and energetic R's, or even actual attack, but this is by means certain. The incident occurred ca. 9:25 a.m., when almost all behavior is very dull and low-intensity.

Earlier this morning I watched what may have been nest building by Fasty Caps. One bird of a pair, and sometimes both, made repeated trips to a particular small tree or large bush (in a mixed bamboo and other shrubby thicket, of considerable extent & thickness). Once I saw that one of the birds was carrying moss in its bill during one of these trips. (I couldn't see the birds well enough during the other trips to tell if they were carrying anything in them bills or not.) The particular part of the bush they appeared to be most interested in, which they visited most frequently, was about

7 feet off the ground. This would definitely suggest that the Song Caps nest off the ground. (Although I was not able to find the nest they may have been building.)

Chloroquinegus, I. October 6, 1960
Cerro Punta

I have been watching Brown-caps in mixed flocks quite a lot during the last few days (see notes on mixed flocks). They are obviously not breeding now, and quite gregarious most of the time.

This morning, however, I noticed (in the woods right around Cerro Punta), that several individual birds seemed to be maintaining territories, and uttering lots of SR's and a few S's, during the ½ hour immediately after dawn. One of these birds, at least, did not seem to have any mate. Eventually, this SR-ing and S-ing stopped; and I think that the territorial birds joined the flocks.

This behavior would suggest that the ♂'s separate from the flocks for long periods each day, even during the height of the non-breeding season. Possibly the bonds between ♂'s and ♀'s tend to dissolve during this season. If so, it might explain why I saw so much what looked like elaborate "pair-formation" behaviors in March of this year and last year.

Chloroquinegus, I April 9, 1961
Cerro Punta

½ Watching Brown-caps near the big bend again this morning. Arrived around 6:20, when it was just getting light. When I arrived, there was a single bird sitting alone on a

telephone wire. Uttering single notes — — — — — with almost continuous and quite extreme S. Just like A last year. But the notes appeared to be a little thinner and longer than "Tst"s. Might be better transcribed as "Tsss"s.

This bird was a quarter of a mile away from the spot where we watched A last year. Almost certainly another ♂. I shall call it "X" (I am quite sure that this bird was male, but I was not able to follow it absolutely clearly & completely from the time it did this "Tsss" - S performance until the first copulation attempt — see below.)

The X ♂ continued this "Tsss" - S performance for approximately 5 minutes. Almost all from the telephone wire. Occasionally flew off to a high bare branch of a tree, quite nearby, and did a little "Tsss" - S there. Always returned to telephone wire within a few seconds.

About 6:30 he perched for a while on the telephone wire and uttered "Tsss"s as before — but without S. Presumably an indication of declining intensity.

Then the X ♂ stopped the "Tsss" performances for a while and started to fly about quite actively, from tree to tree (all within a rather limited area - presumably the ♂'s territory). Feeding a little also uttering a lot of R's. Many (perhaps most?) of these R's were preceded and followed by 1 or 2 other notes. A typical performance may be represented by the following diagram.

The preliminary note was probably an ordinary "Tst" CN. The subsequent R's were definitely usually accelerating. I think that many or most of the R's tended to rise in pitch. The little flourish at the end appa

sored to be a slurred version of the "tswee-yoo" part of an NNN pattern. It could be transcribed as "Eee-yah." I shall call such slurred bi-syllabic or 2-note patterns "(NN)".

Then ♂ B flew back to the perch in the tree from which he had uttered "Tweet"s earlier in the morning; and uttered 5 or 6 more "Tweet"s. Seems as before. I think with ♀, but I am not absolutely sure about this. Then, (approx. 6:35), he flew straight across the road, directly toward another bird, presumably his mate, about 30 yards away. Uttered R-(NN) as he flew and/or just after landing beside this ♀. Then he hopped on to her back and began to copulate with her immediately. (As far as I could tell - and there were some leaves in the way - there were no special pre-copulatory displays by either the ♂ or the ♀.) His copulation was very brief (but still apparently successful). The ♂ only stayed on the ♀'s back for a second or so, beating his wings (probably very much as in ♂♂), and then slid off the ♀. But he mounted her again a second later, and copulated again, apparently successfully, as before, and slid off again almost immediately. A second later, the ♂ hopped on the ♀ again (for the third time) and had another apparently successful copulation. Just as before, beating wings.

At least one of the birds, (almost certainly the ♂), uttered 2 or 3 R-(NN)'s during this copulation performance. I think these not only were uttered when the ♂ was actually on the ♀'s back, as well as when he was off her.

The ♀ did not seem to display much. She appeared to remain in a rather "hunched" posture, with very little or no indication of even an unstudied ♀ posture. (I could not see if her tail was raised or not.) Apparently silent. But she did ♀ vigorously in the intervals between the mountings of the ♂.

As soon as the ♂ got off the ♀ for the third time, he uttered several R patterns, with associated notes. Some of these R performances were essentially R – (NN), like the vocalization diagrammed above on p. 47. Others were similar but had a more distinct NNN at the end.

As far as I could tell, the ♀ had no post-copulation display of any sort after this first series of copulation attempts.

Both birds of the pair flew away after the ♂ had delivered his post-copulation R vocalizations.

A few minutes later, the ♂ was back in the same area, without the ♀. Flying from tree, uttering lots of R's + associated notes, as well as "S"s.

Many other Brown-caps in the neighborhood were uttering similar vocal patterns at more or less the same time. So I concentrated on these for a while.

All the birds uttered R vocalizations like the vocalization diagrammed on p. 47 quite frequently. Almost all these vocalizations were introduced by 1 or a few "CN"s (see below), and ended with an (NN) "See-yah" type flourish. The birds also uttered some R vocalizations which ended with an even briefer flourish than the (NN). A typical vocal performance of this type might be transcribed by something like "Jack tuck tsit-tsit-sreeeeeeeeyoo." The "yoo" at the end of such vocalizations appeared to be a slurred version of the 3rd note of typical NNN's. I shall call it "(N)". A few R's uttered by the birds this morning ended in typical NNN's, but such patterns were relatively very rare. A few R's also ended in plain NN's, "I see-yoo."

All or almost all the R's which ended in NN, NNN, (NN) or (N) were accelerating. I think that all or almost all of them were ascend

ing in pitch. It is possible, however, that some were descending. More or less comme ça ~~~~~

Many (at least) of R's, including R's in all types of vocal patterns cited above, sounded as if they were composed of accelerated "fast" CN's instead of "fuels" CN's.

I also heard a few R's this morning which were not accelerating and did not end by (N) or N type patterns, but which appeared to be approximately stable in pitch ~~~~~

Most of the R performances I heard this morning appeared to be largely or completely hostile. Neighboring birds tending to utter these synchronously. As usual, the longer R performances appeared to be more strongly hostile than the shorter R performances.

This morning, I noticed that the tail usually vibrates up and down very conspicuously during (at least) most moderately to very long R performances. The difference between the upper & lower positions of the tail during R is at least as great as the difference between ——— and ———. Interestingly enough, the wings hardly vibrated at all during the R's I observed this morning. What little vibrations they did seemed to be purely a mechanical consequence of the tail movements. The birds usually or always kept the wings resting on the rump during R's.

As the morning wore on, the birds uttered fewer and fewer vocalizations including long R's. Uttered more and more calls which were more or less comme ça: "Duh duh duh tree-yoo" or "Duh duh duh tet-twice-yoo" Such calls appeared to be brief R's plus

NN or NNN. Presumably relatively low intensity. They were rather stereotyped in form, and I think that they may be in process of becoming ritualized in form. I think that these vocalizations are essentially the same as the vocalizations I called "S" in previous years. In any case, they are what I shall call "S" from now on.

Early late in the morning, I heard several apparently single birds utter pure NNN's, without the burr R of the S patterns.

When ♂ X came back and flew around his territory a few minutes after the first series of copulations this morning — when the ♀ was elsewhere — he uttered a lot of R-(NN) or R-NN calls, in which the (NN) or NN element was "Tsooowee", not "Tseeyoo". Many of these calls were uttered when ♂ X was not close to any territorial rival. And many of them were not closely synchronized with R performances by other birds.

The circumstances and forms of all these associated calls this morning would seem to confirm my previous hypothesis that the R's are hostile. Probably purely hostile. The (N) — NNN patterns are probably produced when some pairing motivation is thwarted. Probably, in all or most cases, when some pairing motivation is in conflict with the hostile motivation. (A ♂ may utter (N) — NNN patterns when he is alone, but his loneliness may irritate him.) I rather think that the "Tsooowee" type of NN is an indication of relatively and/or actually stronger pairing motivation than the "Tseeyoo" type of NN.

I wonder if the NN's of these species are strictly homologous (and analogous) with the SN's of Hirundo and Tangara?

(CORRECTION. Late in the morning, I saw some solitary males utter plain NN's as well as NNN's. These were all "Tsee-yoo" and "Tit-tsuee-yoo" so the "Tsee-yoo" type of NN's

may be nothing more than low-intensity versions of the "Treet-wee" type of NN's.)

I think that the NNN's — and (NNN)'s, if such calls are ever uttered — may be really compound. Composed of a "Tit" CN, plus an NN — or (NN).

Almost all the R performances (of all types, including pure R's and R + various N patterns, and S's), and plain NN's and NNN's this morning were preceded by 1 or more CN-type notes. Unfortunately I have not become used to the birds yet, and I found it very difficult to distinguish between "Tit" and "Tuck" CN's. Perhaps the birds uttered a lot of intermediates this morning.

I am not even sure that the "dawn song" "Treet"s are really distinct from ordinary "Tid"s. But I certainly think so!!!

It was noticeable, this morning, that all the Brown-caps were very vocal for a half hour or so after daylight, but then gradually became less & less vocal. Right at daylight, all the vocalizations tended to be jumbled together and uttered very rapidly one right after the other. It was only later in the morning that they became somewhat easier to distinguish and analyze

Birds uttering the R - S - NNN type of vocalizations usually perch in much less conspicuous and exposed positions than birds uttering the "Treet" "dawn song"

Several times this morning, well after dawn, I heard one or more birds utter relatively prolonged "Treet" or "Treet-treet" notes. These were definitely not uttered by birds on high exposed perches like birds giving the "dawn song" & seldom or never repeated more than once. Unfortunately, I was never able to observe the circumstances of these ambiguous notes. They may have been peculiar variants of the NN.

It's also quite possible that the NN and the "Jeeet"s of the typical "dawn song" are quite closely related to one another.)

About 15 minutes after the end of the first series of copulations this morning, I noted that ♀X had reappeared in the territory of the ♂ X. Both birds flying about quite excitedly, uttering lots of N's ("Jeet"s ?), also lots of R patterns. Sometimes R alone, sometimes R-(NN), sometimes R-NNN, plus all intermediates. Several times, when one bird landed beside the other, one of the birds (probably the landing bird — probably the ♂) uttered a more destructive type of R (each of these R's may have been begun in flight and finished after landing). These peculiar R's began as quite typical R's, but then suddenly became very much softer, without changing pitch. Sometimes

~~~~~ I shall call the soft half of such vocalizations "MR". I think these MR's were quite different from the ER's I heard last year. Not particularly high and then ascending.

Around 7:10, one of the birds (the ♂ ?) suddenly landed beside the other, as one of the birds uttered an R-MR, and another copulation occurred. As before. Apparently successful. I couldn't see the wings of the birds during the instant between the time one bird landed and the copulation occurred, but there was certainly no prolonged ♂ by either bird. There was certainly no ♂ by the ♀ before or during the copulation. Both birds flew away immediately after the ♂ dismounted, without any post-copulation display.

Like the earlier copulations, this copulation was very brief.

The ♂ re-appeared on his territory, and began to behave as before, almost immediately, but the ♀ did not come back for quite a long time
~~~~~

I rather think that the ♀ may have gone to nest build after these copulations

While the ♀ was away this time, the ♂ uttered quite a lot of R-(NN)'s, NNN's, "Jude" CN's, and "Jut" CN's, hopping about in the trees. Then the ♀ returned again (at about 7:35 a.m.), and landed in a tree some distance from the ♂. The ♂ flew to her, immediately (not in stages), flying from perch to perch. He uttered at least one and quite ordinary sounding R as he approached the ♀. When he finally landed right beside the ♀, he did not utter any R or MR, but he may have uttered a few CN's ("Jit"s?). Then he jumped on the ♀'s back and began to copulate. As before. Silent with beating wings. Then he slid off her back and stood beside her. The ♀ stood in a posture some-
what:

Crouching on twig
(9 minute)

In this posture, she did a lot of vigorous ♀. (9 minute her wings tended to remain more drooped during this ♀ than do the wings of a ♂ during "dance-song"; but I am not sure about this.) The ♀ continued ♀ for some time. Finally, silent. Uttered one "Jut" or "Jit" in the middle of the ♀. Then the ♂ hopped on her again & copulated again. Both birds quite silent immediately before and during the copulation. Then the ♂ slid off. No post copulatory display by either bird. Both birds just flew away.

Chilcompingues, Apr 9, 1961, IX (55)

It was really remarkable how little display — especially pre-copulatory display — occurred during these performances. The only distinctive patterns were the MR of the ♂ (obviously nothing more than a slightly modified R) and the ♂ - soliciting of the ♀ (which seemed to be performed when she was unsatisfied by a copulation rather than before a copulation or series of copulations)

It was also remarkable that the ♂ and ♀ were so hostile to one another (as indicated by the frequency of ordinary R's before copulations or series of copulations).

Chilcompingues, I April 10, 1961
Cerro Peneta

Back to the big head again, 6:15 a.m.
The ♂ ↗ giving a "Duet" — ♂ performance as usual this morning I noticed a few more details of the performance.

Typical Posture

The ♂ ↗ looked small headed and large bodied, like the ♂ ↗ I watched perform "Duet" - ♂ last year. Head looked rather angular. Breast & belly fluffed, and rather smoothly rounded. The angle of the head, body, and tail was extremely variable. Head sometimes horizontal, and body & tail much more diagonal than in the accompanying drawing.

The ♂ during these performances is rather different from the ♂ of a soliciting ♂. A ♂ uttering "Duet" usually lifts the wings well above the back at the top of ♂ up-beat ♂ movements. Wings go quite be-

w at the bottom of the downbeat of ♂ Q during "Inct"s, but probably not much below the level of the belly. The whole difference might be summed up by saying that a ♂ uttering "Inct"s lifts his wings straight out from the body and then Q's them; while a ♀ soliciting usually droops her wings a little and then Q's them.

It is also likely that the amplitude of the Q movements is greater, on the average, during the "Inct"-Q of ♂'s than during the soliciting of ♀'s.

(I think that the Q performed by ♂ A with ER last year, as well as the Q accompanying some R's by Sooty-caps, are more like the Q of ♀ Brown-caps during soliciting than like the Q of ♂ Brown-caps uttering "Inct"s.)

♂ X was very active this morning. Flying very frequently, between 3 or 4 different perches (all high and exposed), doing "Inct"-Q at each perch. He also uttered "Inct" notes in flight, when flying from perch to perch.

The X ♂ stopped "Inct"-Q at 6:33 this morning [illegible] to leave the area. Possibly going to feed?

About 6:55, I noticed that the ♂ X was back on his territory. Uttering R-(NN)'s, interspersed with ("Tit"?)CN's. Then the ♀ suddenly appeared. Flew in and landed in a bush about 10 feet away from the ♂. She uttered CN's as she flew in ("Tit"s, I think). The ♂ immediately uttered a long R. (This was very fast and stern. Presumably high intensity — see below. Probably not quite as high and stern as the extreme ER's I heard last year.). The ♂ began the R as soon as he saw the ♀, probably just as she landed, and he flew out to her back immediately afterward, just a few seconds later. As far as I could tell, the ♀ did not perform any sort of pre-cop

relation display before the ♂ mounted. As soon as the ♂ got on the back of the ♀, he copulated. As before, silent and wings beating. Only lasted a few seconds. The ♀ quite silent, without ♀, throughout. Then the ♂ slid off and flew to a perch a few feet away. There, he uttered a fast, high, high intensity R, just like the R he uttered before flying to the ♀ in the first place. The ♀ first sat in an apparently invitational, slightly hunched, posture while the ♂ uttered three R. The ♂ then flew straight on to her back and copulated again. The behavior of both birds was the same as before during this copulation. The copulation itself was also very brief. (All the actual copulations of these birds seem to be very brief.) Again the ♂ flew to a perch a foot away from the ♀, and uttered a high intensity R as before, as soon as he got off the female. This time, the ♀ did one brief burst of soliciting ♀ immediately after the ♂ dismounted. Then just sat in an invitational posture. Again the ♂ flew straight on to her back as soon as he had finished his R. Copulation as before. Again the ♂ flew off to a nearby perch and uttered a high intensity R. This time the ♀ just sat, without ♀, all the time the ♂ uttered R. Again (for the fourth time) the ♂ flew on to the ♀'s back as soon as he had finished his R. Copulation as before. This time the ♀ followed the ♂ when he flew off after the copulation.

All four of these copulations must have occurred within a period of no more than 2 minutes.

The ♂ came back immediately after this series of cops. Flying from tree to tree, or from perch to perch within the same tree. Uttering occasional R-N (s.l.) patterns, including NNN's, S's, and R-(NN)'s.

Then he suddenly started to fly, in strong, steadily in one dir

action. Uttered S or R-(NN) each time he landed after a short flight. At other times, I noticed that the ♀ was sitting quietly a few feet away in the direction in which the ♂ was heading. The ♂ then flew straight out to her back. Copulation as before. ♂ hops off. Utters high intensity R as before on nearby perch. ♀ just sits quietly while he utters the R. Then the ♂ mounts the ♀ as before. Copulation as before. No ♀ display at any time. Then the ♂ slides off, and both birds fly away.

I noticed that the way in which ♂ X mounts the ♀, flying straight out to her back without preliminaries, is closely related to the "Pouncing" of ♂ Song Sparrows and Yellow-thighed Finches.

The ♀X sat in a posture common during all three copulations

flight ft.
throat slightly fluffed.

Sometimes the ♂ pulled her forward, so that her body was almost vertical, bent downward

Some time later in the morning, I watched the X ♂ moving about his territory when he appeared to be alone. He uttered quite a lot of vocalizations from time to time. The usual type, plus a number of them, were, "Tseee" Notes. These were the same as the notes I transcribed as "Tseet" and "Tseet-tseet" in the last paragraph of page 52 (yesterday's field notes).

This morning these "Tseee" Notes usually (but not always) occurred in doublets. Sometimes, but not usually, alone. Usually done as enunciated, usually preceding other vocal patterns. Quite frequently

"Tseee - tseeee tseee - tsss" (the last 2 notes in this vocalization apparently being a typical NN.)
somewhat less frequently "Tseee - tseeee - NNN" and "Tseee - tseeee - S".

While the ♂ was uttering these vocalizations, he constantly looked across the road. I finally discovered that he was looking at the female when he did this. He finally flew across the road and joined the ♀. Then the 2 birds hopped and flew through the bushes, more or less together. The ♂ (?) once uttered an R-NR when he followed the ♀ in flight. Once or both birds also uttered quite a lot of "Tsit tsit - R - (N)"s and "Tseee - tseeee - R - (N)"s as they moved about together.

This behavior would seem to confirm the hypothesis that these "Tseee" notes are equivalent to (presumably strictly homologous with) the SN's of Albuquerque and Tangara, the PCN's of the Tangara de Soto, the WW's of the Green-headed Sparrow, and (probably) some notes of many other species of bush-finches and bush-tanagers.

I think I shall call these "Tseee" notes of the Brown-capped Bush-tanagers "SN" also.

I am now sure that SN's of the Brown-caps are also closely related to both the "Tseet"s of the "dawn song" and typical NN's.

The "Tseet"s of the "dawn song" are presumably strictly homologous with the "Kew" and "Keyoo" notes of the "Keyoo song" of the Tangara de Soto, the "Whew" notes of the "dawn song" of the Buff-throated Saltator, and the "Kew" notes of the "dawn song" of the Streaked Saltator.

The NN's are presumably strictly homologous with the similar notes in the ordinary or "day" songs of many other species.

The SN's, "dawn song" notes, and more or less boogleduc "day song" notes (or their equivalents) are obviously closely related to one another in all the species in which they occur.

There were several prolonged disputes, involving at least 4 birds (including one or both the X's) among the birds in my area this morning. Lots of aerial chasing. Occasional scuffles in evr.

All the hostility was accompanied by lots of "Jeek" CN's (esp early in flight) and lots of R patterns (especially when the birds were perched). Many of these R patterns were of the usual type, as described above. I noticed, however, that whenever the disputing seemed to be particularly intense, when several birds were fluttering about close together, with lots of supplanting attacks, etc., many of the R's became very rapid and rather stri-sounding (with little or no N-type notes at the end). Presumably an indication of high intensity hostility. I don't think that any of the R's I heard today were quite as extreme as the ER's I heard last year (not as prolonged anyhow). But they did make me think that ER's are probably nothing more than the most extreme high intensity version of ordinary R (i.e. purely hostile, without any significant sexual component — MR's are probably the only type of R which are partly the direct results of activated sexual motivation)

I don't think that any of the R's I heard today were accompanied by TV and/or Q; but I can't be sure of this.

When the disputes were particularly intense this morning, the birds also uttered a lot of "Zeeeee Zeeeeee ..... " or "Zeeeeeaaa Zeeeeaaa ..... " notes. Quite like SN's, but rather hoarser in quality. I don't think they could have been variations of the SN pattern sometimes uttered singly. Sometimes in irregular series (usually 2, 3, or 4 notes, I think)

I think these notes must have been the HAC of this species. (I think my earlier statements that this species has an HAC more like the HAC's of other species were probably mistaken or misleading.)

These "Zeeeeee" notes were probably closely related to the notes as labeled & transcribed as "Sreeeee" before (see note p. 4, Sep. 17, 1958, and p. 6, Sep. 21, 1958); but I could not detect any subtle variations in the notes this morning. Possibly the notes uttered today were slightly different from the notes I heard in 1958?

Unfortunately, I could not determine, this morning, if the "Zeeeeee" notes were accompanied by any special postures or movements.

I rather think that the "Zeeeee" notes I heard this morning must have been the same as the notes I transcribed as "Wheeet" on Mar. 2, 1959 (see p. 8), and Mar. 3, 1959, (see p. 13).

Chlorospingus, I April 11, 1961
Cerro Punta

Watching the Brown-caps by the log head again, from 6:15 onward. I did not watch the X birds as steadily today as yesterday and the day before. But I did watch an adjacent bird, "Y", off and on for some time.

Y appears to be a ♂. When I first arrived this morning, he was perched high in a tree. Uttering "Sneet"s.

These "Sneet"s were quite like those of the X ♂ in sound, but definitely slightly harsher. Possibly also slightly louder.

The Y ♂ sat in the usual variety of postures while he uttered these "Sneet"s. Interestingly enough, however, he did not usually do

♀ during the period he uttered "Tseet"s. He only did one brief and slight bout of ♂, once, just after landing on a new perch (where he continued "Tseet"s without ♂) (Like the other ♂'s I have watched utter "Tseet" "down songs", Y seemed to have at least 2 or 3 favorite perches from which to utter this "song".)

I also noticed that the X ♂ tends to do particularly vigorous ♂ just after landing. (He may do equally vigorous ♂ at other times, but the most vigorous type of ♂ occurs most frequently just after landing.)

These facts would indicate that there is some definite, presumably causal, correlation between ♂ and flight. Is ♂ an intention movement, i.e. a low intensity indication, of flight?

The Y ♂ stopped uttering "Tseet"s a few minutes earlier than did the X ♂ this morning. There are also indications that the Y ♂ is not as advanced in the breeding cycle as the X ♂, or that he has gone further past the pairing phase of the breeding cycle, (see below). It seems likely, therefore, that "Tseet"s without ♂ are lower intensity than "Tseet"s with ♂.

When Y stopped "Tseet"ing, he continued to fly from perch to perch with his tentors, and continued to show a definite preference for high perches, very much like the perches from which he had been giving "Tseet"s. (Some of these perches were the same, in fact.) On these high perches, he uttered a lot of long R-(NN)'s. (Most of the (NN)'s he uttered at this time were little more than the slightest of "Ee-ya"s). At the same time he also uttered an appreciable number of NNN's. The usual sequence of these vocal patterns was quite stereotyped. Usually 4 or 5 R-(NN)'s, followed by 2 NNN's, followed by 4 or 5 R-(NN)'s, followed by 2 NNN's, followed by 4 or 5

R-(NN)'s, etc. etc. etc.

The ♂ also uttered some "first" CN's during this performance. Usually or always single. Apparently scattered at random among the R-(NN)'s and NNN's.

Perhaps the most striking feature of this performance was the usual arrangement of NNN's in doublets. (Only once or twice did the ♂ utter a single NNN.) I don't know what the significance of this arrangement may be. It seemed to be characteristic of ♂. (Even later in the morning, when he uttered vocalizations only occasionally, he still uttered his NNN's in doublets, or uttered a doublet-type combination of SN + NNN — as below.)

During his earlier performance this morning, when he was uttering lots of R-(NN)'s and NNN's from high perches, the ♂ sometimes uttered a combination of SN + NNN, or an intermediate pattern, instead of a typical pair of NNN's. These combinations and intermediates were quite variable, but they were usually more or less doublet-like in form sometimes "Ja-treeeee titriweeeyou" or "Tree-treeee titriweeeyou" sometimes Tseee-treeeee tseee-you"

(I think that the second note is always longest and loudest in all doublet SN type vocalizations.) The doublet SN's in all these SN-NN and SN-NNN combinations sounded as if they were little or nothing more than slightly modified NN's and/or abbreviated NNN's.

The ♂ also occasionally added a few extra single or doublet SN's before and/or after doublet NNN's or combinations of SN + N patterns.

Some of the NNN's uttered by ♂ Y during this performance

were "Tetwoonyee". But I think that most of them were "Tetwee yoo".

The ♂ continued to utter these R-(NN) and doubled NNN and/or SN-NNN combinations quite steadily for quite some time after he stopped "Feet" wig.

All these vocalizations were uttered from unrestrained sitting postures (and/or the postures usually accompanying "Feet"s)

This R-(NN) + NNN and/or SN-NNN combination performance was probably produced by much the same combination of drives as the usual S performances of the species — but was probably higher in intensity (The S contains almost all the same components as this R-(NN) + NNN and/or SN-NNN combination performance, but arranged in a much simpler way.) It is probably significant that the ♂ did not utter any typical S's early this morning (all the R's of his R-(NN)'s contained many more syllables than the R component of typical S's). S's are uttered relatively most frequently by not very active birds. In the non-breeding season. And in the afternoons and even mings of the breeding season

It is probably also highly significant that the ♂ was quite alone, without any ♀ around, during the whole period when he was uttering this R-(NN) + NNN and/or SN-NNN combination performance. The SN components were probably an indication of strong frustration of sexual and/or pairing motivation (see also below).

As far as I could tell, in fact, the ♂ was alone almost the whole morning. Only once did I see him with a ♀, very briefly. At this time an apparent copulation attempt occurred. Obviously unsuccessful. The ♂ uttered a high intensity R (without TV or Q) standing right beside the ♀, and then tried to mount her. The ♀ threw him off immediately.

She may even have perked at him. Then she hopped away. The ♂ followed her, uttering brief R-(N)'s or R-(NN)'s. Then the ♀ flew away. The ♂ did not follow

Some time later I noticed that the Y ♂ was giving an R-(NN) + NNN and/or SN-NNN combination performance again.

The X ♂ did not do as much & with his "Jeet"s this morning as he did yesterday and the day before. Begin of declining intensity?

When he stopped "Jeet"ing (around 6:32), I saw that he had been joined by the ♀. They hopped about, feeding together. During this period, the ♂ uttered quite a lot of long R-(NN)'s. Also occasional NNN's.

Then the ♀ left for a while. During this period, the ♂ uttered lots of R's (perhaps provokedly vigilious?), and R-(NN)'s. also occasional NNN's and SN-NNN combinations and intermediates.

This behavior would suggest that the SN patterns may be an indication of more strongly initiated pairing and/or sexual motivation than the NNN patterns.

The ♀ came back to "visit" the ♂ X from time to time, until approximately 07:30 a.m. When she was with him, the ♂ uttered the usual vocalizations, but little or no high intensity R, and certainly no ER or MR. As far as I could tell, moreover, the X birds did not copulate or attempt to copulate at any time this morning. I think that the ♀ must be incubating now

I noticed this morning that "Jit"s seemed to be the most common CV's uttered by the birds I was watching.

Chlorospingus, I. April 12, 1961
Cerro Punta

Watching the birds near the great bend of the road again this morning. From 6:15 to 7:00 a.m.

Both ♂♂ and ♀♂ were back in their usual places, uttering "Sneet"s. At first both behaved in exactly the same way as yesterday.

♀♂ stopped uttering "Sneet"s alone quite early. Began to alternate series of "Sneet"s (usually 3-5 notes in a series) with S's (usually 1 or 2 at a time). No Q. Sitting on high exposed perches in usual postures accompanying "Sneet"s alone. Occasionally uttered a long R-(NN) instead of an S. This continued for quite a long while. His "Sneet"s eventually became less extreme, more like "Sit"s.

Eventually the ♀♂ just slipped into the usual behavior of a ♂ alone on his territory during the later part of the morning. Only a few actually few vocalizations. And these of the usual type.

The ♂♂ continued to utter "Sneet"s for an unusually long time this morning. Possibly because the ♀ didn't show up for a long time. But all or most of his later "Sneet"s were not accompanied by Q. Finally, around 6:50 or 7:00 a.m., the ♂♂ stopped uttered "Sneet"s, and began a medley of "Sit"s, R-(NN)'s, S's, and NNN's. Also 1 or 2 SN's

I think the ♀ X may have visited the ♂, briefly, this morning. But the birds were relatively very quiet. Apparently no copulations.

Late in the morning, I watched an obviously mated pair flitting about together and feeding in trees & bushes by the road. The presumed ♂ uttered high intensity R's when following the presumed

♀ in flight, and also whenever approaching her on a branch. Also the usual variety of other notes. But no copulation attempts. (I am almost certain that neither of these birds was an X or a Y.)

This afternoon I watched some Brown-caps in an area about half way between Cerro Punta and the upper pasture

Two birds moved around and fed together for quite a long time. Apparently a well-mated pair. Apparently no other Brown-caps in the area. It may be significant, therefore, that these 2 Brown-caps were relatively very quiet. Uttered a lot of "Tit"s while feeding. More "Tit"s accelerated into a semi-trill or semi-R when they flew. It is my impression that the "Tit"s they uttered in flight were definitely louder and harder than the "Tit"s they uttered when hopping about in a tree. Possibly the "Tit"s in flight were transitional to "Tuck"s? One or both of the birds also uttered an occasional single or double SN. No S's, no NNN's, no real R's.

At one time this afternoon, when I was particularly close to the pair of Brown-caps, when they were feeding in a tree, I heard a very soft "Ta za za za za za za" sound uttered twice. Very much like the HAC of the Flame-colored Tanagers in quality (see today's notes on Periauga). But there were no Flame-colored Tanagers around at the time, and the sound seemed to come from the Brown-caps. Could this be a GHAC of the Brown-caps?????

Chlorospingus, I. April 13, 1961
Cerro Punta

Went back to the same area, half way between Cerro Punta and the upper pasture, early this morning

When I arrived (6:20 a.m.), there was a single bird perched high in a tree, uttering a lot of single "Tsit" notes. No Q. The "Tsit" notes were uttered rather more rapidly than the "Tsut"s of the dawn songs of ♂'s X and Y. I think that the utterance of such "Tsit"s must be the correct intensity form of the "Tsut"-Q performance. The bird who uttered these "Tsit"s this morning was probably the ♂ of the pair I watched yesterday afternoon. I shall call him "♂Z".

Later in the morning, I encountered a single Brown-cap in a bush. It flitted about, uttering lots of harsh "Tsit"s or "Tsck"s. Also performed lots of WF's and TF's. The TF's were usually, perhaps always, slightly D-V. Always very rapid, and with a very strong lateral component.

I also heard one Brown-cap utter an accelerated, "chew," high intensity R (not real ER) when it attacked another Brown-cap. This would suggest that the R is definitely relatively aggressive.

Chlorospingus, I — April 16, 1962
Eeno Pienta

Working in usual area just below upper pasture this morning. Sooty-caps still around, in spite of the fact that most of the nearby forest has been burned and cut down.

There was at least 1 bird (probably 3) perching on top dead tree stumps in the usual Sooty cap fashion this morning. Definitely quite silent. Remarkably prolonged. One bird was still doing it at 7:40 a.m.!!!